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(54) METHOD AND SYSTEM FOR ONLINE REORGANIZATION OF DATABASES

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(21) Appl. No.: 10/159,613

(22) Filed: May 31, 2002

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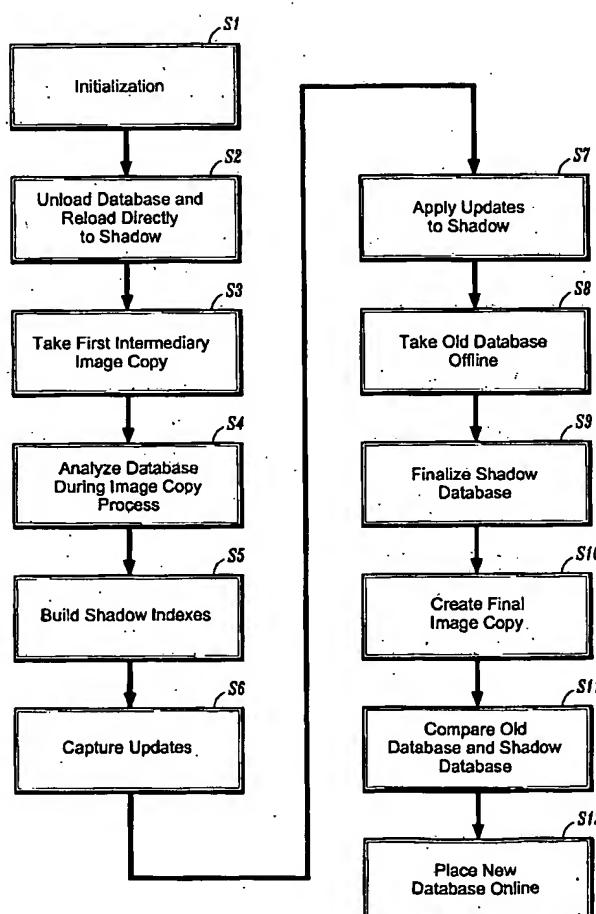
(60) Provisional application No. 60/294,811, filed on May 31, 2001. ✓

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(51) Int. Cl. 7 G06F 7/00
(52) U.S. Cl. 707/1

(57) ABSTRACT

A system and method for online reorganization of an existing database that occurs while read and update activity of the existing database continues. The system and method comprise unloading the existing database, reloading the existing database directly to a shadow database, building shadow database indexes, creating a first intermediary image copy of the existing database, analyzing the existing database, capturing updates for the existing database, applying the captured updates to the shadow database, taking the existing database offline, finalizing the shadow database with any remaining updates, creating a final image copy, comparing the existing database and the finalized shadow database, and placing the finalized shadow database online.



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R. J. Peterson, J. P. Strickland

March 1983 **Proceedings of the 2nd ACM SIGACT-SIGMOD symposium on Principles of database systems**

Full text available: [pdf\(2.14 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#)

Keywords: database, database management system, process synchronization point, recovery strategy, resource consistency, system failure, system log, transaction

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Peter G. Neumann

January 1996 **ACM SIGSOFT Software Engineering Notes**, Volume 21 Issue 1

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Peter G. Neumann

January 1992 **ACM SIGSOFT Software Engineering Notes**, Volume 17 Issue 1

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1 Session 6: Log write-ahead protocols and IMS/VS logging 

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January 1992 **ACM SIGSOFT Software Engineering Notes**, Volume 17 Issue 1

Full text available:  [pdf\(1.65 MB\)](#) Additional Information: [full citation](#), [citations](#), [index terms](#)

4 Kill-safe synchronization abstractions 

Matthew Flatt, Robert Bruce Findler

June 2004 **ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 2004 conference on Programming language design and implementation**, Volume 39 Issue 6

Full text available:  [pdf\(138.55 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

When an individual task can be forcefully terminated at any time, cooperating tasks must communicate carefully. For example, if two tasks share an object, and if one task is terminated while it manipulates the object, the object may remain in an inconsistent or frozen state that incapacitates the other task. To support communication among terminable tasks, language run-time systems (and operating systems) provide kill-safe abstractions for inter-task communication. No kill-safe guarantee is avai ...

5 A structural view of the Cedar programming environment 

Daniel C. Swinehart, Polle T. Zellweger, Richard J. Beach, Robert B. Hagmann

**August 1986 ACM Transactions on Programming Languages and Systems (TOPLAS),
Volume 8 Issue 4**

Full text available:  pdf(6.32 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an overview of the Cedar programming environment, focusing on its overall structure—that is, the major components of Cedar and the way they are organized. Cedar supports the development of programs written in a single programming language, also called Cedar. Its primary purpose is to increase the productivity of programmers whose activities include experimental programming and the development of prototype software systems for a high-performance personal computer. T ...

6 The design of OWL a language for walking 

Marc D. Donner

June 1983 **Proceedings of the 1983 ACM SIGPLAN symposium on Programming language issues in software systems**

Full text available:  pdf(607.62 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes the syntax, semantics, and design rationale for a programming language developed to provide real-time concurrent processes for the programming of a six legged walking robot.

7 Progress-based regulation of low-importance processes 

John R. Douceur, William J. Bolosky

December 1999 **ACM SIGOPS Operating Systems Review , Proceedings of the seventeenth ACM symposium on Operating systems principles**, Volume 33 Issue 5

Full text available:  pdf(1.53 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

MS Manners is a mechanism that employs progress-based regulation to prevent resource contention with low-importance processes from degrading the performance of high-importance processes. The mechanism assumes that resource contention that degrades the performance of a high-importance process will also retard the progress of the low-importance process. MS Manners detects this contention by monitoring the progress of the low-importance process and inferring resource contention from a drop in the p ...

Keywords: process priority, progress-based feedback, symmetric resource contention

8 Architecture of the IBM system/370 

Richard P. Case, Andris Padegs

January 1978 **Communications of the ACM**, Volume 21 Issue 1

Full text available:  pdf(2.78 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper discusses the design considerations for the architectural extensions that distinguish System/370 from System/360. It comments on some experiences with the original objectives for System/360 and on the efforts to achieve them, and it describes the reasons and objectives for extending the architecture. It covers virtual storage, program control, data-manipulation instructions, timing facilities, multiprocessing, debugging and monitoring, error handling, and input/output operations. ...

Keywords: architecture, computer systems, error handling, instruction sets, virtual storage

9 TraceBack: first fault diagnosis by reconstruction of distributed control flow 

Andrew Ayers, Richard Schooler, Chris Metcalf, Anant Agarwal, Junghwan Rhee, Emmett Witchel

June 2005 **ACM SIGPLAN Notices , Proceedings of the 2005 ACM SIGPLAN conference**

on Programming language design and implementation PLDI '05, Volume 40
Issue 6

Full text available: [pdf\(347.77 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Faults that occur in production systems are the most important faults to fix, but most production systems lack the debugging facilities present in development environments. TraceBack provides debugging information for production systems by providing execution history data about program problems (such as crashes, hangs, and exceptions). TraceBack supports features commonly found in production environments such as multiple threads, dynamically loaded modules, multiple source languages (e.g., Java ...)

Keywords: fault diagnosis, instrumentation

10 Virtualizing Transactional Memory 

Ravi Rajwar, Maurice Herlihy, Konrad Lai

June 2005 **Proceedings of the 32nd Annual International Symposium on Computer Architecture ISCA '05**

Full text available: [pdf\(199.77 KB\)](#) Additional Information: [full citation](#), [abstract](#)

Writing concurrent programs is difficult because of the complexity of ensuring proper synchronization. Conventional lock-based synchronization suffers from well-known limitations, so researchers have considered non-blocking transactions as an alternative. Recent hardware proposals have demonstrated how transactions can achieve high performance while not suffering limitations of lock-based mechanisms. However, current hardware proposals require programmers to be aware of platform-specific resource ...

11 Improving the browsing experience: A framework for coordinated multi-modal browsing with multiple clients 

Alistair Coles, Eric Deliot, Tom Melamed, Kevin Lansard

May 2003 **Proceedings of the 12th international conference on World Wide Web**

Full text available: [pdf\(111.38 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

As users acquire or gain access to an increasingly diverse range of web access clients, web applications are adapting their user interfaces to support multiple modalities on multiple client types. User experiences can be enhanced by clients with differing capabilities combining to provide a distributed user interface to applications. Indeed, users will be frustrated if their interaction with applications is limited to one client at a time. This paper discusses the requirements for coordinating we ...

Keywords: multi-modal browsing, web proxy

12 Performance evaluation of the Orca shared-object system 

Henri E. Bal, Raoul Bhoedjang, Rutger Hofman, Ceriel Jacobs, Koen Langendoen, Tim Rühl, M. Frans Kaashoek

February 1998 **ACM Transactions on Computer Systems (TOCS)**, Volume 16 Issue 1

Full text available: [pdf\(179.39 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Orca is a portable, object-based distributed shared memory (DSM) system. This article studies and evaluates the design choices made in the Orca system and compares Orca with other DSMs. The article gives a quantitative analysis of Orca's coherence protocol (based on write-updates with function shipping), the totally ordered group communication protocol, the strategy for object placement, and the all-software, user-space architecture.

Performance measurements for 10 parallel applications ill ...

Keywords: distributed shared memory, parallel processing, portability

13 Converging CSP specifications and C++ programming via selective formalism

William B. Gardner

May 2005 **ACM Transactions on Embedded Computing Systems (TECS)**, Volume 4 Issue 2Full text available:  pdf(617.07 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

CSP (communicating sequential processes) is a useful algebraic notation for creating a hierarchical behavioral specification for concurrent systems, due to its formal interprocess synchronization and communication semantics. CSP specifications are amenable to simulation and formal verification by model-checking tools. A translator has been created to synthesize C++ code from CSP for execution with an object-oriented framework called CSP++, thereby making CSP specifications di ...

Keywords: Executable specifications, hardware/software codesign, object-oriented application frameworks

14 A protocol for failure and recovery detection to support partitioned operation in distributed database systems

Jung K. Kim, Geneva G. Belford

November 1986 **Proceedings of 1986 ACM Fall joint computer conference**Full text available:  pdf(957.95 KB) Additional Information: [full citation](#), [references](#), [index terms](#)**15 Technical correspondence**

CORPORATE Tech Correspondence

October 1989 **Communications of the ACM**, Volume 32 Issue 10Full text available:  pdf(2.15 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)**16 Architecture of the space shuttle primary avionics software system**

Gene D. Carlow

September 1984 **Communications of the ACM**, Volume 27 Issue 9Full text available:  pdf(1.26 MB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

PASS, perhaps the most complex flight computer program ever developed, epitomizes the benefits to be gained by establishing a well-structured system architecture at the front end of the development process

Keywords: PASS, PASS space shuttle, avionics system, space shuttle

17 Hive: fault containment for shared-memory multiprocessors

J. Chapin, M. Rosenblum, S. Devine, T. Lahiri, D. Teodosiu, A. Gupta

December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles**, Volume 29 Issue 5Full text available:  pdf(1.90 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)**18 Research sessions: new styles of XML: Data stream management for historical XML data**

Sujoe Bose, Leonidas Fegaras

June 2004 **Proceedings of the 2004 ACM SIGMOD international conference on Management of data**Full text available:  pdf(207.19 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

We are presenting a framework for continuous querying of time-varying streamed XML

data. A continuous stream in our framework consists of a finite XML document followed by a continuous stream of updates. The unit of update is an XML fragment, which can relate to other fragments through system-generated unique IDs. The reconstruction of temporal data from continuous updates at a current time is never materialized and historical queries operate directly on the fragmented streams. We are incorporate ...

19 A distributed monitoring mechanism for wireless sensor networks

Chih-fan Hsin, Mingyan Liu

September 2002 **Proceedings of the ACM workshop on Wireless security**

Full text available:  pdf(318.53 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we focus on a large class of wireless sensor networks that are designed and used for monitoring and surveillance. The single most important mechanism underlying such systems is the monitoring of the network itself, that is, the control center needs to be constantly made aware of the existence/health of all the sensors in the network for security reasons. In this study we present plausible alternative communication strategies that can achieve this goal, and then develop and study in ...

Keywords: monitor and surveillance, security, system design, wireless sensor networks

20 Session summaries from the 17th symposium on operating systems principle (SOSP'99)

Jay Lepreau, Eric Eide

April 2000 **ACM SIGOPS Operating Systems Review**, Volume 34 Issue 2

Full text available:  pdf(3.15 MB) Additional Information: [full citation](#), [index terms](#)

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21 Special issue: AI in engineering

D. Sriram, R. Joobani

January 1985 **ACM SIGART Bulletin**, Issue 91

Full text available: [pdf\(8.79 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The papers in this special issue were compiled from responses to the announcement in the July 1984 issue of the SIGART newsletter and notices posted over the ARPAnet. The interest being shown in this area is reflected in the sixty papers received from over six countries. About half the papers were received over the computer network.

22 Risks to the public in computers and related systems

Peter G. Neumann

April 1990 **ACM SIGSOFT Software Engineering Notes**, Volume 15 Issue 2

Full text available: [pdf\(2.07 MB\)](#) Additional Information: [full citation](#), [index terms](#)

23 M65MP: An experiment in OS/360 multiprocessing

Bernard I. Witt

January 1968 **Proceedings of the 1968 23rd ACM national conference**

Full text available: [pdf\(1.07 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The System/360 Model 65 multiprocessing system (M65MP) described in this paper exists and is in operation at the IBM facility in Gaithersburg, Maryland. The Gaithersburg programming effort is the base for IBM's support of multiprocessing announced on January 3, 1968. The only purpose of this paper, however, is to relate strictly personal observations about the development period and the results accomplished.

24 Server networks communicating via inter-user shared variables

Lawrence Zeidner

January 1987 **ACM SIGAPL APL Quote Quad , Proceedings of the international conference on APL: APL in transition**, Volume 17 Issue 4

Full text available: [pdf\(1.13 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Server networks are generalized networks of asynchronous software processes interconnected by prescribed communication links according to prescribed protocols. As large-system-integration tools, they facilitate a divide-and-conquer approach, separating large software system development problems into a set of smaller problems programmed-in-the-small via standard software techniques within the confines of each server's virtual machine. In addition, server networks, programmed-in-the-large, kn ...

25 Wireless and mobility: Habitat monitoring: application driver for wireless communications technology

Alberto Cerpa, Jeremy Elson, Deborah Estrin, Lewis Girod, Michael Hamilton, Jerry Zhao
April 2001 **ACM SIGCOMM Computer Communication Review**, Volume 31 Issue 2 supplement

Full text available:  pdf(2.46 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

As new fabrication and integration technologies reduce the cost and size of micro-sensors and wireless interfaces, it becomes feasible to deploy densely distributed wireless networks of sensors and actuators. These systems promise to revolutionize biological, earth, and environmental monitoring applications, providing data at granularities unrealizable by other means. In addition to the challenges of miniaturization, new system architectures and new network algorithms must be developed to transf ...

Keywords: applications, low-power wireless, sensor networks, testbeds

26 The STARS process engine: language and architecture to support process capture and multi-user execution

Scott Arthur Moody
November 1994 **Proceedings of the conference on TRI-Ada '94**

Full text available:  pdf(1.43 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Process-centered computing environments are currently in their infancy, with notable exceptions [1][19][21][22]. Two important components of envisioned environments are the language used to describe the processes, and the architecture for the language implementation and execution. These must support the multi-user emphasis of team work, process monitoring, process improvement, and automated execution. This paper reports on the STARS Process Engin ...

27 A comparison of Ada and Java as a foundation teaching language

Benjamin M. Brosgol
September 1998 **ACM SIGAda Ada Letters**, Volume XVIII Issue 5

Full text available:  pdf(1.49 MB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

Java has entered the software arena in unprecedeted fashion, upstaging languages and technologies that are longstanding players in the industry. Almost unheard of before 1995, the language and its surrounding technology are attracting increasing attention not merely in the hardware and software communities but also among lay users and in the popular press. This phenomenon has not escaped the attention of academia, and a growing number of colleges and universities are looking at Java as a candid ...

28 Operating system enhancement through firmware

George E. Brown, Richard Eckhouse, Jay Estabrook
September 1977 **ACM SIGMICRO Newsletter , Proceedings of the 10th annual workshop on Microprogramming**, Volume 8 Issue 3

Full text available:  pdf(910.45 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Microprogramming support for the enhancement of operating system design is described in detail, organization structure of realtime operating systems are examined, and criteria proposed for determining which functions are best for firmware implementation. Also, a closed queueing network model with state dependent routing probabilities is developed for studying the impact of microprogramming on a tactical computer system performance. Based on measurement obtained from two applications, the ma ...

29

The arpanet telnet protocol: Its purpose, principles, implementation, and impact on host operating system design

J. Davidson, W. Hathaway, J. Postel, N. Mimno, R. Thomas, D. Walden
September 1977 **Proceedings of the fifth symposium on Data communications**

Full text available:  pdf(1.32 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The protocol discussed in this paper was developed by many members of the ARPANET community starting in 1969 and continuing through the present. Many individuals and institutions have been members of this community at one time or another over the years. A review of the documents, both working and published, written on the subject of this protocol reveals that the following individuals were among those who contributed to the protocol design: A. Bhushan, R. Braden, R. Bressler, J. Burchfiel, ...

30 An overview of DARK

R. van Scy, J. Bamberger, R. Firth

November 1989 **ACM SIGAda Ada Letters**, Volume IX Issue 7

Full text available:  pdf(651.63 KB)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

Ada is now being mandated for a large number of DoD development projects as the sole programming language to be used for developing software. Many of these projects are trying to build distributed real-time systems. Many project managers and contractors are anxious to support this effort, to reap the advantages of Ada, and to use the newer techniques of software engineering that Ada can support. This transition, however, has not always been smooth; some serious problems have been encountered. Th ...

31 Saving portable computer battery power through remote process execution

Alexey Rudenko, Peter Reiher, Gerald J. Popek, Geoffrey H. Kuenning

January 1998 **ACM SIGMOBILE Mobile Computing and Communications Review**, Volume 2 Issue 1

Full text available:  pdf(1.28 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

We describe a new approach to power saving and battery life extension on an untethered laptop through wireless remote processing of power-costly tasks. We ran a series of experiments comparing the power consumption of processes run locally with that of the same processes run remotely. We examined the trade-off between communication power expenditures and the power cost of local processing. This paper describes our methodology and results of our experiments. We suggest ways to further improve thi ...

32 Risks to the public in computers and related systems

Peter G. Neumann

July 1991 **ACM SIGSOFT Software Engineering Notes**, Volume 16 Issue 3

Full text available:  pdf(2.79 MB)

Additional Information: [full citation](#), [index terms](#)

33 Scripted documents: a hypermedia path mechanism

P. T. Zellweger

November 1989 **Proceedings of the second annual ACM conference on Hypertext**

Full text available:  pdf(1.17 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The concept of a path, or ordered traversal of some links in a hypertext, has been a part of the hypertext notion from its early formation. Although paths can help to solve two major problems with hypertext systems, namely user disorientation and high cognitive overhead for users, their value has not been recognized. Paths can also provide the backbone for computations over a hypertext, an important issue for the future of hypertext. This paper constructs a framework for un ...

34 The remote processing framework for portable computer power saving

Alexey Rudenko, Peter Reiher, Gerald J. Popek, Geoffrey H. Kuenning

February 1999 **Proceedings of the 1999 ACM symposium on Applied computing**

Full text available: [pdf\(888.21 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: client server, laptop battery, power saving, remote processing, wireless communication

35 An object-oriented, distributed architecture for large-scale Ada systems

Phillipe Kruchten, Christopher J. Thompson

November 1994 **Proceedings of the conference on TRI-Ada '94**

Full text available: [pdf\(1.14 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an architectural model ideally suited for the description of large, distributed command and control systems. This model is organized around multiple dimensions (or views) of software architecture and is used to describe the software architecture of a family of automated air traffic control systems currently under development by Hughes Aircraft of Canada. Some of the features of this family of systems are described, and in particular the mechanism used for transparent acc ...

36 Visualization using timelines

Gerald M. Karam

August 1994 **Proceedings of the 1994 ACM SIGSOFT international symposium on Software testing and analysis**

Full text available: [pdf\(1.45 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A timeline is a linear, graphical visualization of events over time. For example, in concurrent application, events would represent state changes for some system object (such as a task or variable). A timeline display generator creates the graphical visualization from some record of events. This paper reports on a model for timeline display generators based on a formal model of event history and the objectives of timeline visualization. In this model, any timeline display generator is compl ...

37 How to write parallel programs: a guide to the perplexed

Nicholas Carriero, David Gelernter

September 1989 **ACM Computing Surveys (CSUR)**, Volume 21 Issue 3

Full text available: [pdf\(3.27 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

We present a framework for parallel programming, based on three conceptual classes for understanding parallelism and three programming paradigms for implementing parallel programs. The conceptual classes are result parallelism, which centers on parallel computation of all elements in a data structure; agenda parallelism, which specifies an agenda of tasks for parallel execution; and specialist parallelism, in which specialist agents solve problems cooperatively. The programming paradigms ce ...

38 Logistics/transportation applications: General topics: a voice assisted simulation-animation architecture

Raymond L. Smith, Stephen D. Roberts

December 2000 **Proceedings of the 32nd conference on Winter simulation**

Full text available: [pdf\(382.09 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper introduces a software architecture that has been used to enable voice assistance for a simulation-animation environment by integrating technologies that recognize spoken language input and generate spoken language output. Voice assisted technology has several features which make user navigation within complex software applications easier than traditional methods, such as key-typed commands or mouse manipulation. While this environment might be more friendly to an end user, several cha ...

**39 User Interfaces for Applications on a Wrist Watch**

M. T. Raghunath, Chandra Narayanaswami

January 2002 **Personal and Ubiquitous Computing**, Volume 6 Issue 1Full text available: [pdf\(356.91 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

Advances in technology have made it possible to package a reasonably powerful processor and memory subsystem coupled with an ultra high-resolution display and wireless communication into a wrist watch. This introduces a set of challenges in the nature of input devices, navigation, applications, and other areas. This paper describes a wearable computing platform in a wrist watch form-factor we have developed. We built two versions: one with a low resolution liquid crystal display; and another wit ...

**40 Simulation modeling and analysis with INSIGHT: a tutorial**

Stephen D. Roberts, Mary Ann Flanigan

December 1988 **Proceedings of the 20th conference on Winter simulation**Full text available: [pdf\(1.26 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The INSIGHT simulation language describes systems in a quick, simple, and compact fashion using a network representation. This description can be entered and simulated using novel interactive facilities that free the user from learning specific syntax. Statistics summarizing the simulation are produced automatically, but can be greatly enhanced by various input models and output analysis mechanisms. Use of the language does not require programming and complex models use the descriptive feat ...

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41 [Simulation modeling and analysis with INSIGHT \(tutorial session\): a tutorial](#)

Stephen D. Roberts, Mary Ann Flanigan

December 1990 **Proceedings of the 22nd conference on Winter simulation**

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42 [Recollections on the processing of biomedical signals](#)

J. R. Cox

December 1987 **Proceedings of ACM conference on History of medical informatics**

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The processing of biomedical signals took many steps forward in the two decades that followed the introduction of digital computers to the field in the late 50s. Along with my colleagues at the Central Institute for the Deaf and at the Biomedical Computer Laboratory, I was privileged to participate in this exciting early period of biomedical computing. Some of my experiences with projects, both successful and unsuccessful, in evoked response audiometry, neurophysiology, fetal electrocardiog ...

43 [Risks to the public in computer systems](#)

Peter G. Neumann

April 1986 **ACM SIGSOFT Software Engineering Notes**, Volume 11 Issue 2

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44 [A few examples of how to use a symmetrical multi-micro-processor](#)

Guy Mazare

March 1977 **ACM SIGARCH Computer Architecture News , Proceedings of the 4th annual symposium on Computer architecture**, Volume 5 Issue 7

Full text available: [pdf\(480.15 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)



This paper presents an overview of an architecture of a multi-micro-processor architecture in which all processors are equivalent. The structure is characterized by a central memory and several caches, and is designed to avoid incoherent data. A fast mechanism of "subcontracting" between one processor and another is described. The execution of two simple programs under this architecture is studied. The parallel algorithms are described and compared with the original (...

45

[HCSM: a framework for behavior and scenario control in virtual environments](#)



James Cremer, Joseph Kearney, Yiannis Papelis

July 1995 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 5
Issue 3

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This paper presents HCSM, a framework for behavior and scenario control based on communicating hierarchical, concurrent state machines. We specify the structure and an operational execution model of HCSM's state machines. Without providing formal semantics, we provide enough detail to implement the state machines and an execution engine to run them. HCSM explicitly marries the reactive (or logical) portion of system behavior with the control activities that produce the behavior. HCSM state ...

Keywords: autonomous agents, behavior modeling, interactive simulation, reactive systems, real-time simulation, scenario control, state machines, virtual environments

46 The use of timing simulation in air force integrated avionics 

Donald A. Bertke, Mark E. Minges

April 1991 **Proceedings of the 24th annual symposium on Simulation**

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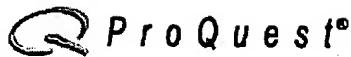
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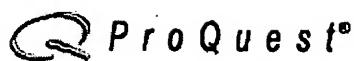
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